UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/579,670	05/26/2000	Miles Aram de Forest	DG-663	3652

7590	06/14/2004

Gary D Clapp Esq
66 Blanford Place
Bedford, NH 03110

EXAMINER
MASKULINSKI, MICHAEL C

ART UNIT	PAPER NUMBER
2113	

DATE MAILED: 06/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _24 April 2004_.
2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-16_ is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) _1-16_ is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a)☐ All b)☐ Some * c)☐ None of:
      1.☐ Certified copies of the priority documents have been received.
      2.☐ Certified copies of the priority documents have been received in Application No. _____.
      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
          application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)
1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.
4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: _____.

Non-Final Rejection

Claim Objections

1.   Claim 11 is objected to because of the following informalities: in line 15, the

claim language states "operating concurrently in cooperatively with". The Examiner

believes that this should read, "operating concurrently and cooperatively with".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2.   The text of those sections of Title 35, U.S. Code not included in this action can

be found in a prior Office action.

3.   Claims 1, 3, 5, 9, 11, 13, and 15 are rejected under 35 U.S.C. 102(e) as being

anticipated by Rastogi et al., U.S. Patent 6,205,449.

Referring to claims 1, 3, 5, 9, 11, 13, and 15:

a.   In column 3, lines 8-21 and in Figure 1, Rastogi et al. teach a storage sub-

system and a first and second control/processing sub-systems, each including a

file system processor performing file transaction operations in response to client

requests directed to the first and second control/processing sub-systems and

controlling file storage operations of the storage sub-system. Further, in column

3, lines 11-12, Rastogi et al. teach that the first and second control/processing

sub-systems operating concurrently and in parallel.

b.   In column 3, lines 23-47 and in Figure 1, Rastogi et al. teach a state

machine logging mechanism operating concurrently and cooperative with the file

system processor.

c.   In column 3, lines 23-57, Rastogi et al. teach a state machine log

generator for extracting state machine information defining at least one state

machine during an execution of an operation, the at least one state machine

representing a current state of execution of a file transaction of the corresponding

control/processing sub-system.

d.   In column 3, lines 22-27, Rastogi et al. teach that the control/processing

sub-system is a state machine system defined during execution of an operation

by at least one sequential state machine defined by a state of operation of the

state machine system during a step in the execution of the operation, and

wherein a file transaction operation is represented by at least one sequential

state machine wherein each state machine is defined by data and control values

residing in the state machine system during existence of state machine of the

sequence).

e.   Although, Rastogi et al. don't explicitly teach a state machine that is

comprised of state information including control and data values representing a

state of operation of the control/processing sub-system at a given time, having

state information including control and data values is inherent to the system of

Rastogi et al. This is evident in column 3, lines 11-12 where Rastogi et al.

disclose a secondary system, which is run in parallel with a primary system.

Further, in column 3, lines 36-42, Rastogi et al. disclose that the second system

is synchronized with the primary system, for example, via log records

communicated through the network from the primary system to the secondary

system, and is thus available to take over processing immediately is the primary

system fails or is disconnected. As can be seen the second system has to know

the control and data values in order to immediately takeover for the primary

system.

f.   In column 3, lines 35-61, Rastogi et al. teach that the log generator is

responsive to the restoration of operation after a failure of the corresponding

control/processing sub-system for reading the information from the log and

restoring the state of execution of a file transaction of the corresponding

control/processing sub-system.

Claim Rejections - 35 USC § 103

4.   The text of those sections of Title 35, U.S. Code not included in this action can

be found in a prior Office action.

5.   Claims 2, 4, 6, 8, 10, 12, 14, and 16 are rejected under 35 U.S.C. 103(a) as

being unpatentable over Rastogi et al., U.S. Patent 6,205,449, and further in view of

Kandasamy et al., U.S. Patent 5,513,314.

Referring to claims 2, 4, 6, 8, 10, 12, 14, and 16, Rastogi et al. teach a back-up

mechanism responsive to the restoration of operation of the other control/processing

sub-system after a failure of the other control/processing subsystem for reading the

information from the log back-up mechanism to the other control/processing sub-system

(see column 3, line 48 through column 4, line 59). However Rastogi et al. don't

explicitly teach that the back-up is receiving and storing mirror copies of the state

machine information concurrently and in parallel with the state machine log. In column

6, lines 4-21, Kandasamy et al. disclose that the secondary file server concurrently

performs all file creation type NFS operations and NFS data update operations

requested by any client workstations. It would have been obvious to one of ordinary

skill at the time of the invention to include the concurrent backup of Kandasamy et al.

into the system of Rastogi et al. A person of ordinary skill in the art would have been

motivated to make the modification because it provides the advantage that failover

between a mutually fault tolerance protected server systems is relatively instantaneous

(see Kandasamy et al.: column 3, lines 31-36).

Response to Arguments

6.   Applicant's arguments filed April 9, 2004 have been fully considered but they are

not persuasive.

7.   On page 21, under the section REMARKS, the Applicant argues, "in complete

and fundamental contrast from Rastogi et al. '449, the system of the present invention

captures and stores state machines representing the detailed operation of the system in

the execution of each transaction and stores these state machines while the

corresponding transaction is being executed, so that the execution of a transaction may

be continued or resumed at any time, not just at the end or beginning of a transaction."

The Examiner respectfully disagrees. In column 10, lines 52-61, Rastogi et al. disclose that once all the redo log records have been applied, the active transactions are rolled back. To do this, all completed operations that have been invoked directly by the transaction, or have been directly invoked by an incomplete operation have to be rolled back. In other words, the current state of a transaction is maintained.

8.   On pages 22-23, under the section REMARKS, the Applicant argues, "the transaction log of the Rastogi et al. '449 system captures or generates only transaction records only when the, that is, a record of a completed transaction at the conclusion of the transaction, and actually records, or stores, a transaction record only when the record is transferred into mass storage. In a like manner, the copy of a transaction record is transmitted to and stored in the secondary computer system only when the record is transferred to the primary system mass storage." The Examiner respectfully disagrees. There is a transaction record constantly being maintained. It is then later transferred to mass storage. Further, the Examiner requests that the Applicant specifically point out where Rastogi et al. teach or disclose this. Further, on page 23, the Applicant argues, "A close reading of Rastogi et al. '449 reveals, however, that Rastogi et al. '449 speaks only of the operations of a transaction, and not the states of operation of a system while executing a transaction." Again the Examiner requests that the Applicant give specific columns and lines where this is taught. In column 10, lines 52-61, Rastogi et al. disclose rolling back active transactions.

9.   On page 23, under the section REMARKS, the Applicant argues, "Rastogi et al. '449 essentially only describes representing a transaction in the primary system

transaction log in terms of what are in fact the instructions or commands initiating each operation at each level, and perhaps any data input to the operation. At no point does Rastogi et al. '449 describe or even mention a 'state machine system', a 'state machine', system 'state' as represented by the control and data values residing in the system at a given point during the execution of a transaction and defining the 'state machine' of the system at that point." The Examiner respectfully disagrees. Again the Applicant fails to give specific columns and lines where Rastogi et al. teach or disclose this. Further, the Applicant acknowledges that Rastogi et al. do disclose control and data values by admitting that the transaction log represents instructions or commands (control values) and perhaps any data input to the operation (data values) at each level.

10.   On page 25, under the section REMARKS, the Applicant argues, "Rastogi et al. '449 does not in fact address whether a log entry contains information taken during the execution of the transaction, or only the starting data, operations commands and instructions and transaction results that are essential to reconstruction of the transaction. It would seem reasonable, however, to those of skill in the arts, to store no more transaction information than is necessary to redo or undo the transaction, which would require only the starting data, operations commands and instructions and transaction results." The Examiner respectfully disagrees. Storing starting data and operations commands is equivalent to storing data and control values.

11.   On page 25, under the section REMARKS, the Applicant argues, "Rastogi et al. '449 does not even mention restoring or resuming a transaction in the at any point during the actual execution of the transaction, that is, at some point in the middle of the

execution of the transaction, which would require the capture and storage of the sequence of state machines defining the transaction." The Examiner respectfully disagrees. In column 10, lines 52-61, Rastogi et al. disclose applying redo log records to roll back active transactions. Therefore the transaction can be rolled back even in the middle of the transaction.

12.   On page 27, under the section REMARKS, the Applicant argues, "It is further noted that the Examiner has in fact agreed and stated that Rastogi et al. '449 does not and cannot teach or even suggest the capture, logging and restoration of transactions as sequences of state machines including the control and data values residing in and controlling the system at each step of the execution of a transaction." The Examiner disagrees. If the Applicant wants to know what the Examiner has or hasn't stated, then it is suggested that the Applicant read the rejection above because the Examiner has made no such statement.

13.   On page 28, under the section, REMARKS, the Applicant argues, "Finally in further distinction between the present invention and the teachings of Rastogi et al. '449, it must be noted that the primary and secondary computer systems of the Rastogi et al. '449 system do not correspond either structurally or functionally with the dual control/processing sub-systems of the present invention. That is two computer systems of the Rastogi et al. '449 system are not parallel, cooperating sub-systems within a system, but are completely and separate computer systems." The Examiner respectfully disagrees. In column 3, lines 11-12, Rastogi et al. explicitly disclose that a "hot spare" is a secondary system, which is run in **parallel** with a primary system. If the

Applicant is attempting to claim that the two sub-systems are operating at the same time

so that the full processing power of the two control/processing sub-systems is typically

available at all time to process requests from clients, the Examiner draws the

Applicant's attention to Hemphill et al., U.S. Patent 5,781,716 where that is taught.

14.   On pages 28-29, under the section REMARKS, the Applicant argues, "the

primary and secondary computer systems of the Rastogi et al. '449 system do not

correspond either structurally or functionally with the state machine logging mechanism

and state machine log mirroring mechanism of the present invention as each of the

primary and secondary computer systems of the Rastogi et al. '449 system are a full

function, general purpose computer capable of performing both transaction operations

and transaction logging. In contrast, the state machine logging mechanism and state

machine log mirroring mechanism of the present invention are both dedicated purpose,

specialized function mechanisms that are structurally and functionally different from one

another and are directed to separate and distinctly different functions." The Examiner

respectfully disagrees. This argument has been addressed in paragraph 7 of the Final

Office Action, paper no. 9, mailed January 12, 2004. The Examiner's response can be

found there.

15.   On page 29, under the section REMARKS, the Applicant argues, "a

control/processing sub-system and its associated state machine logging mechanism

with the associated state machine logging mechanism with the associated state

machine log mirroring mechanism cannot be compared, structurally or functionally, with

the primary and secondary computer systems of the Rastogi et al. '449 system because

the primary and secondary computer systems of the Rastogi et al. '449 system are in

fact identical but completely separate and independent systems from one another. In

contrast, the state machine log mirroring mechanism is functionally an integral element

of the corresponding state machine logging mechanism, even though the state machine

log mirroring system resides separately from the state machine logging mechanism so

as not to be involved in a failure of the corresponding control/processing sub-system

with which the state machine log generator and log reside." The Examiner respectfully

disagrees. This argument has been addressed in paragraph 8 of the Final Office

Action, paper no. 9, mailed January 12, 2004. The Examiner's response can be found

there.

Conclusion

16.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

U.S. Patent 6,457,098 B1   DeKoning et al.

U.S. Patent 6,073,218   DeKoning et al.

U.S. Patent 5,781,716   Hemphill et al.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Michael C Maskulinski whose telephone number is (703)

308-6674. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Robert W Beausoliel can be reached on (703) 305-9713. The fax phone

number for the organization where this application or proceeding is assigned is 703-

872-9306.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

MM

ROBERT BEAUSOLIEL
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100